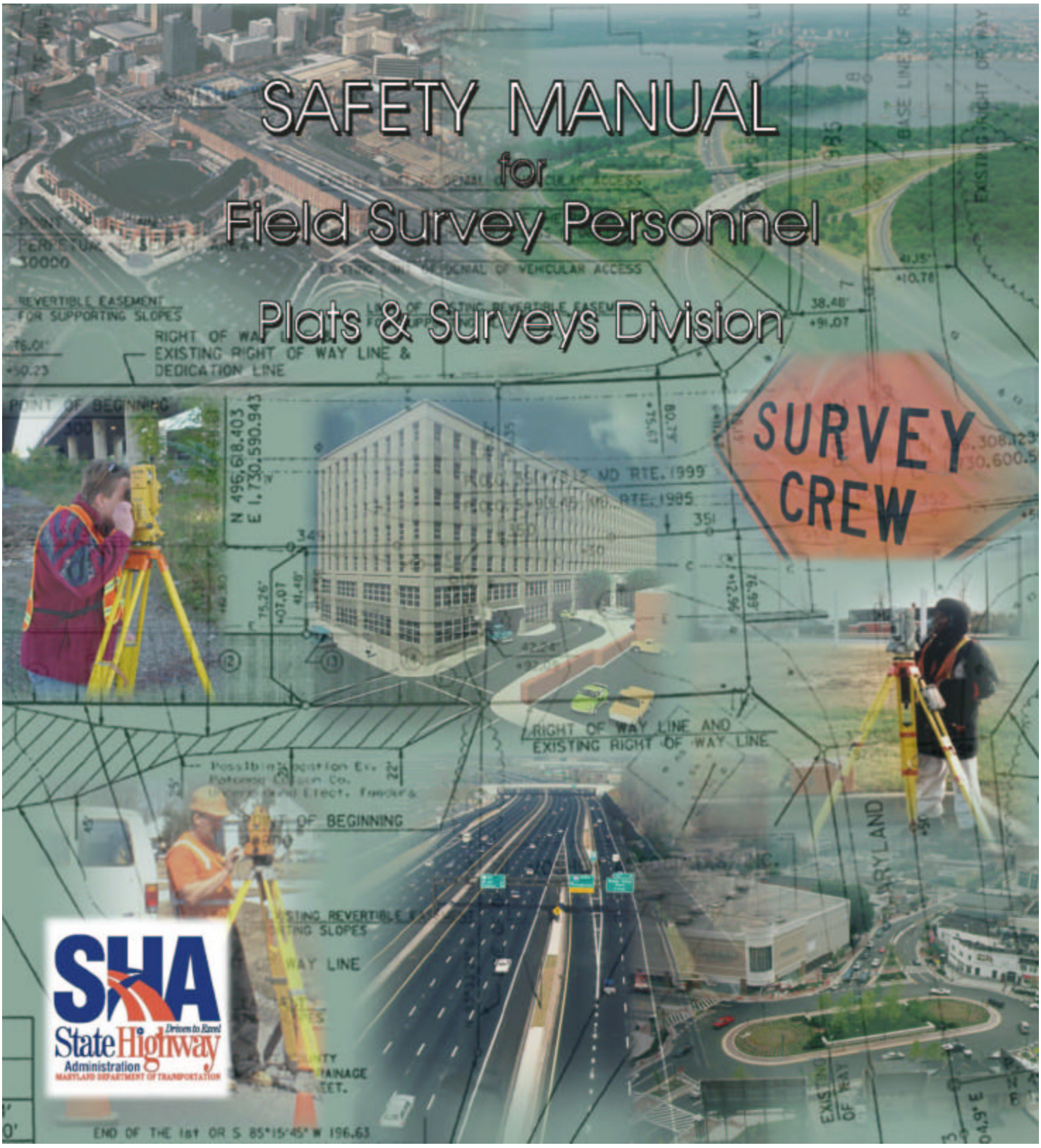

SAFETY MANUAL
for
Field Survey Personnel
Plats & Surveys Division
SURVEY CREW
SHA
State Highway
Administration
MARYLAND DEPARTMENT OF TRANSPORTATION

JULY 2003

SAFETY MANUAL

FOR

PLATS & SURVEYS DIVISION

DISCLAIMER AND USE STATE MENT

The Plats and Surveys Division has prepared these guidelines for use by all SHA personnel and consultant firms performing field surveys on Maryland roadways. It is not the intent of this manual to be a comprehensive guide or to replace any applicable industry standards or guidelines. These guidelines are to be used in conjunction with all laws and traffic standards and other manuals currently recognized by the American Association of State Highway and Transportation Officials (AASHTO), Maryland Department of Transportation and the Maryland State Highway Administration.

The Plats and Surveys Division does not guarantee the accuracy or completeness of any information contained in this manual. Individual and Professional judgement must be exercised in the application and interpretation of these general guidelines. The policies and procedures contained in this manual are minimum safety standards and are not intended to supercede existing federal, state or local regulations or industry wide accepted practices.

CONTENTS

I. RESPONSIBILITIES

A. It is the responsibility of everyone using the roadways of Maryland to practice lawful, safe and courteous conduct. This applies to people in the work force as well as the driving public.

B. In performing field surveys, personnel are to be aware of certain individual responsibilities including, but not limited to the following:

1. Knowledge of safety rules and regulations.
2. The need to be well rested and to use good judgement.
3. Demonstrate total concentration, especially when working in or around traffic.
4. Keep equipment in good operating condition, including regular and preventive maintenance of all vehicles and equipment.
5. Understand emergency procedures and responsibilities regarding accidents or injuries.
6. Wear appropriate clothing and safety gear.
7. Obey all safety and traffic laws when operating company vehicles and equipment.
8. Report any unsafe conditions immediately to the proper authority (i.e., Party Chief, Area Engineer, Survey Coordinator, Assistant Division Chief).
9. Manual of Uniform Traffic Control Devices (MUTCD).

C. Training and equipment are supplied as needed to insure that the working conditions are as safe as possible. These items include, but are not limited to the following:

1. Provide vehicles in good working condition.
2. Promote regular and preventive maintenance of vehicles and equipment.
3. Maintain an inventory to replace worn or obsolete equipment.
4. Provide training and/or certification necessary for any specialized operation such as:
   - First Aid
   - CPR
   - Railroad Safety
   - Flagger Training
5. Inform employees of changes, additions and/or revisions to policies, guidelines and procedures.

II. TRAFFIC

A. General

Employee travel throughout the State of Maryland must be maintained with emphasis on safety, mobility and convenience. Every employee that performs duties on roadways and project sites must make a commitment to play an important role in the success of the work effort and products.

B. Traffic Control & Public Safety

1. Traffic safety should be planned in advance to ensure that operations are as safe as practical for the situation.
   - Keep safety of workers in mind.
   - Keep safety of road users in mind.

2. Work efforts should limit interference with traffic as much as possible. Survey operations should strive to:
   - Avoid abrupt changes of traffic pattern.
   - Provide protection for workers, the work vehicle and the traveling public.
   - Perform work in a safe manner and complete work as quickly as possible.
   - Accommodate pedestrians and cyclists.

3. Use appropriate traffc control devices to provide clear and positive guidance to roadway users through the work zone including but not limited to:
   - Advance warning area.
   - Transition area.
   - Work activity area.

C. Traffic Control Devices

Traffic control devices help ensure highway safety by providing for the orderly and predictable movement of traffic. Traffic control devices also alert road users and provide the guidance and warning that may be necessary for users to get through the work zone safely.

To be effective, traffic control devices must be in accordance with MUTCD and meet these basic requirements:

- Fulfill a need to direct and/or warn road users of a work zone
- Command attention
- Convey a clear and simple meaning
- Command respect of road users
- Allow adequate time for proper response by roadway users

Basic considerations are employed to insure that requirements are met, including but not limited to the following:

- Design
- Placement
- Operation/Application
- Maintenance
- Uniformity

1. Signs and Cones

Procedures for control of traffic for mobile surveys are similar to maintenance and construction sites as outlined in the "Manual on Uniform Traffic Control Devices" (MUTCD) and the "Work Zone Traffic Control Manual" (WZTC).

a. **Specifications:** All mobile survey signs positioned by Survey Crews are to be **48" x 48" in size with "SURVEY CREW AHEAD"** or other appropriate message. All signage shall be constructed of reflective material in accordance with the Manual for Uniform Traffic Control Devices (MUTCD), AASHTO and other SHA Standards. Reflective traffic cones are to have a minimum height of **28"**. **All personnel must wear reflective vests in good condition when working along and/or within the Right-of-Way of any roadway.**

b. Position Standards based on type of roadway:

The location and placement of signs are based on the roadway type, and conditions at the time work is being performed.

(1) Expressways with roadway lane closure

Traffic control is typically supplied by a District Shop or a Maintenance of Traffic Consultant under contract. The position and spacing of signs and cones shall be in accordance with existing Office of Traffic (OOTS) and MUTCD guidelines.

Expressways with off-road and/or shoulder area

Traffic control shall be provided by the Survey Party with **48" x 48"** reflective signs placed at a minimum of **1000 ft** in advance of the mobile work area. Personnel and equipment on the shoulder should be adequately protected with **28"** reflective traffic cones as the mobile work area progresses along the roadway.

(2) Primary and Secondary Roadway with roadway lane closure

Traffic control shall be provided by the Survey Party with **48" x 48"** reflective signs at a minimum of **500 ft** in advance of the mobile work area and **28"** reflective cones spaced at a distance in feet approximately equal to the speed limit for taper of **500 ft**.

Primary and Secondary Roadway without a lane closure

Traffic control shall be provided by the Survey Party with **48" x 48"** reflective signs at a minimum of **350 ft** in advance of the mobile work area and **28"** reflective cones spaced in the center of the road at a distance in feet approximately equal to twice the speed limit.

Primary and Secondary Roadways – off-road and/or shoulder areas

Traffic control shall be provided by the Survey Party with **48" x 48"** reflective signs at a minimum of **300 ft** in advance of the mobile work area and **28"** reflective cones along the shoulder near the edge of the road spaced at a distance in feet approximately twice the speed limit.

2. Vehicles and Equipment

a. Each operator is responsible for the safe operation of their vehicle and must adhere to and obey:
   - All applicable "Traffic Laws and Regulations"
   - General Rules for "Drivers of State Owned Vehicles and Equipment."

b. The operator must have a valid Driver's License required for the class of vehicle being driven.

c. All individuals driving, riding in or operating a State vehicle **must** wear seat belts.

d. All vehicles that are working or parked on the roadway should be of a color that is easily visible to the driving public and be equipped with rotating and/or flashing beacons.

e. Conventional survey vans desirably should be minimum of one ton and be capable of carrying adequate signs and cones needed to control non-lane closure operations. If necessary, heavy duty springs should be added to handle the additional weight.

f. GPS and other specialized surveys may require off-road type vehicles equipped with four wheel drive.

g. As a daily routine, the Party Chief or Team Leader should ensure that the survey vehicle is in proper working condition including but not limited to:
   - Lights
   - Brakes including emergency/parking brake
   - Fuel and all fluids
   - Tires

h. It is the responsibility of **all** crew members to routinely check tools and other gear and inform the Party Chief of their condition. This includes items such as: signs, cones, vests, hard hats, brush hooks, axes, tree trimmers, mauls, chain saws, frost pins, hip boots, waders, etc.

i. All survey trucks shall carry approved fire extinguishers and first aid kits, which shall be so placed in the vehicle as to be readily available.

j. Gasoline carried in vehicles must be transported and stored in safety containers.

k. Both the transmission and emergency/parking brake shall be used to retard vehicle movement when unattended.

l. For security reasons all survey vans/trucks should have tinted windows and be equipped with burglar alarms.

m. Use special caution when working with electronic and/or laser type equipment. If correctly operated and maintained, the lasers provided in the instruments are not hazardous to the eye. However, the manufacturer cautions against looking directly or indirectly into the beam.

III. WORKING CONDITIONS

A. Traffic

The most dangerous working condition a Survey Party deals with is exposure to traffic. The working conditions are an inherent part of the job and personnel are responsible to conduct themselves appropriately to protect their own safety as well as the safety of other employees and road users.

Every project should be assessed for safety needs by the Area Engineer and Staffing Coordinator prior to the start of survey activities.

- Adequate resources to perform operations for projects should be provided in consultation with the Area Engineer, Staffing Coordinator, Assistant Division Chief and/or Division Chief as required. This includes the number of personnel required.
- The Party Chief or Team Leader should take reasonable safety precautions to ensure that the work site is as safe as possible prior to start of work and during operations. The Party Chief or Team Leader is to alert their supervisor of any safety concerns that may develop during field operations.
- The Party Chief or Team Leader should consult with the Area Engineer, Staffing Coordinator, Assistant Division Chief and/or Division Chief as necessary to institute measures in order to make the work zone as safe as possible. This may include additional manpower or additional traffic safety devices.
- It is the Party Chief or Team Leader's responsibility to advise the Division's management and the survey coordinator of any situation that may require additional manpower, traffic control devices and/or personnel to safely perform the field activity.

Factors to consider when implementing temporary traffic controls are:

- Prevailing traffic speed.
- Peak traffic hours for work on roadways vary (work is typically limited on high volume roadways to the hours between 9 a.m. to 3 p.m.).
- Motorists' sight distances.
- Effect of unusual survey activities.
- Pavement conditions – wet, icy, etc.
- Special conditions and events, such as school hours, large public gatherings, etc.

- Holidays (survey operations on high traffic volume roadways are restricted from the day before, through the day after, a major holiday).

Along with Traffic Control procedures covered in Sect. II of these guidelines, there are basic responsibilities and precautions to be taken by each member of the survey crew:

- Always be alert.
- Never work in areas without appropriate traffic control procedures in place.
- Wear appropriate safety clothing (vests, hard hats, hard soled shoes, etc.).
- Never take unnecessary risks.
- Never work if under the influence of drugs or alcohol.
- Beware of becoming complacent with traffic conditions.

B. Wooded Areas

1. Clothing

a. Party members should wear high boots with non-slip soles. The lace type are preferable because they afford more ankle support than loose pull-on type. Tennis shoes or other cloth shoes shall not be worn, nor should boots with thin or worn-out soles. They are easily penetrated by sharp stubs, nails or glass.

b. Trousers should be without cuffs and shorts shall not be worn at anytime during working hours.

c. Lightweight clothing that is light in color is recommended for summer surveying work.

d. When working in cold weather, lightweight insulated underwear is recommended. Outer clothing should be layered to allow air circulation. Snow suits or insulated overalls are also recommended.

e. It is best to stay out of wooded areas and/or fields during hunting season. When it is necessary to work in these areas, bright colored clothing should be worn to provide a safer environment.

2. Hazards

a. Poison Ivy, Poison Oak and Poison Sumac

These are the single most common cause of allergic reactions in the United States. Each year, 10 to 50 million Americans develop an allergic rash after contact with these poisonous plants. The rashes are basically the same and for convenience, their chemistry and identification will be addressed as one.

What is it?

The rash is an allergic contact rash (dermatitis) caused by contact with an oil called **"urushiol"** (you-Roo-shee-ol). Urushiol is found in the sap of poison ivy, poison oak and poison sumac. It is a colorless or pale yellow oil that oozes from any cut or crushed part of the plant, including the roots, stems and leaves. After exposure to air, urushiol turns brownish black, making it easier to spot. Contact with urushiol can occur in three ways:

- **Direct contact** – touching the sap of the toxic plant.
- **Indirect contact** – touching something to which urushiol has spread. The oil can stick to the fur of animals, to tools, or any objects that have come into contact with a crushed or broken plant.
- **Airborne** – urushiol particles, such as burning plants may come in contact with your skin.

Once urushiol touches the skin, it begins to penetrate within minutes. In those individuals who are sensitive, a reaction appears as a line or streak of rash, usually within **12 to 48 hours**. Redness and swelling occur often followed by blisters and severe itching. In a few days, the blisters may become crusted and begin to scale. The rash takes **10 days** or longer to heal.

The rash can affect almost any part of your body, especially where the skin is thin, such as your face. A rash develops less often on soles of your feet and palms of your hands, where the skin is thicker. The rash does not spread, although it may seem to when it breaks out in new areas. This may happen because urushiol absorbs more slowly into skin that is thicker, such as your forearms, legs and trunk.

Prevention

The best protection is to recognize the plants and avoid contact. If you need to be in the area of the plants you should wear long pants, long sleeves, boots and gloves.

Barrier skin creams such as a lotion containing **Bentoquatum (Ivy Block)** offer some protection before contact with poison oak, poison ivy and poison sumac. This over-the-counter product prevents urushiol from penetrating the skin.

Immunization

Investigators have found that most people could be immunized through prescription pills. These pills contain gradually increasing amounts of active extract from the plants. However, this procedure can take four months to achieve reasonable degree of "hypo-sensitization." In addition, the medication must be continued over a long period of time and it can often cause uncomfortable side effects. This procedure is recommended only for individuals who must live or work in areas where they come in constant contact with the plants.

Treatment

Wash all exposed area with cold running water as soon as you can reach a water source. If you can do this within five minutes, the water may keep the urushiol from contacting your skin and spreading to other parts of your body. Within the first 30 minutes, soap and water are helpful.

Rinse or wash your clothing outside where practical or in a washing machine with detergent. If you bring your clothes into your house, be careful that you do not transfer the urushiol to rugs or furniture. You also may dry clean contaminated clothes. Because urushiol can remain active for months, wash all tools that were in contact with the oil.

In severe cases, prescription cortisone can halt the reaction if used early. If you know you have been exposed and have developed severe reactions in the past, consult your dermatologist. He or she may prescribe cortisone or other medicines that can prevent blisters from forming. If you receive treatment with a cortisone-like drug, you should take it longer than six days or the rash may return.

Recognition

Poison Oak
In the East, this plant grows as a small branching shrub which grows to a height of about three feet. The foliage occurs in groups of three somewhat hairy lobed, or deeply toothed leaflets. The fruit is a whitish, wax-like berry which is poisonous to the touch.

Poison Ivy
In the East, this plant is low and woody when young but later may become a high climbing creeping vine. It bears dark green leaves composed of three oval shaped leaflets which may be slightly or entirely toothed along the edges. The leaves have an oily appearance. This appearance plus their dark color along with the fact that they are always found in groups of three serves as an easy mark of identification. When mature, the plants bear a white waxy berry, which is poisonous to the touch. In the spring poison ivy has yellow-green flowers, while in the fall the leaves turn scarlet.

Poison Sumac

This plant grows in standing water in peat bog and swampy areas. It appears as acourse, woody shrub or small tree, never as a vine. The leaves are seven to thirteen leaflets arranged as pairs along a central midrib with a single leaflet at the end. They have a smooth velvet texture, bright orange in the spring. They turn to a dark glossy green with scarlet midrib in summer. Early fall they have orange and russet colors.

b. Bees, Hornets and Wasps

Fortunately, the nests of these insects are not difficult to see and avoid. One exception is the nest of the **yellow jacket** that may be covered by leaves, under logs, stumps, or rocks. There are usually a few flying around the entrance to the nest, so caution should be used when working in that area.

c. Chiggers

Chiggers are very tiny insects, the larva of which attaches itself to the skin and injects a digestive fluid. Itching from secreted enzymes results several hours after contact. Small red welts appear and secondary infection often follows as the result of scratching. The degree of irritation varies with individuals.

Chiggers are found in woods, high grass or weeds and lawns. To minimize chiggers bites, apply powdered sulfur or commercial insect repellents to the ankles, legs, waist and arms prior to going into field. Avoid sitting on the ground or on logs and avoid low vegetation, if possible.

d. Spiders

The **Brown Recluse** spider has an oval body with eight legs. It is light yellow to medium dark brown and has a distinctive mark shaped like a fiddle on its back. It is about three-fourths of an inch long from toe to toe. Bites produce an almost painless sting, but in two to eight hours pain may be noticed followed by blisters, swelling, hemorrhage or ulceration. Some people experience rash, nausea, jaundice, chills, fever, cramps or joint pain. Left untreated, the necrosis may continue and extend over an area of 10 centimeters or more, and can result in extensive scaring. Severe cases often require surgery and skin grafting. Brown recluse spider venom contains at least nine (9) different poisonous protein enzymes, similar to rattlesnake venom. It affects blood vessels in the area of the bite, causing ischemia and tissue damage and death. The bite wound may fester and form new wounds (ulcers) as cellular damage from the venom progresses for a prolonged but unpredictable period, resulting in the possible loss of limb and even death.

Typically, the brown recluse bite is treated with general wound care, tetanus immunization, and antibiotics. Dapsone (a sulfone derivative with a variety of antibacterial and antituberculosis effects) has been used to treat some patients. Results of Dapsone-treated patients are generally better than those treated with early excision of the lesion, but there are side effects such as hemolysis in some patients.

The **Black Widow** spider's color varies from dark brown to glossy black. There is a red or yellow hourglass marking on the underside of the females abdomen which is absent on the male. Only the female black widow spiders are poisonous.

Overall length with legs extended is about one and one-half inches. Bites cause a local redness and two red spots may appear. Pain follows almost immediately. Larger muscles become rigid and body temperature rises slightly. Profuse perspiration and tendency toward nausea follow. It is usually difficult to breath or talk and

where fatalities occur (on only about five percent of bite cases), death is caused by asphxiation.

Initial treatment should begin with thorough wound cleansing, and appropriate tetanus prophylaxis. Hypertension that does not respond to analgesics require treatment with antihypertensive medication. In severe cases, intravenous administration of equine antivenin quickly alleviates pain and can be life saving. Because of the risk of anaphylaxis and serum sickness, antivenin should be reserved for severe cases involving respiratory arrest, uncontrollable hypertension, seizures or pregnancy.

Most spiders prefer dark places in old trash piles, rough ground, under stones, logs, hollow stumps, brush piles, inside barns, garages or outhouses. To avoid being bitten, workers should wear gloves when in these areas.

e. Ticks

The tick attaches itself to the skin and sucks blood. It sometime carries and spreads **Rocky Mountain Spotted Fever**, Tularemia and Colorado Tick Fever.

Ticks are found on low shrubs, grasses and trees, and are especially abundant in pastures and around cattle.

To protect against tick bites:

- Cover exposed parts of the body when in tick infested areas.
- Wear boots and fasten the trouser legs over boot tops.
- Oil boots heavily with boot oil.
- Spray trouser legs with insect repellent.
- Periodically wipe the back of your neck with your hand.
- Inspect body and clothing twice a day and remove ticks. **Do not crush** them with your fingernails as this may transmit disease carrying organisms to the skin.

Note: Deer Ticks and Lyme Disease are covered in another section of these guidelines.

f. Snakes

Poisonous snakes are identified by three (3) features:

- A pit or hole between the eye and the nostril
- Eye pupils look like vertical slits
- All have V-shaped heads

Non-poisonous species do not have the pit and their eye pupils are round like a fish eye. All pit vipers are dangerous when born and will even strike while still in the birth membrane.

To minimize the chance of being bitten by a snake:

- Wear high boots in snake country.
- Wear leather gloves when moving brush, rocks, timber or other objects.
- Always assume snakes are active regardless of the temperature.
- Walk heavily to create vibration that can be felt by snakes because they cannot hear.
- Avoid steep climbs where a snake uphill from you could strike upper portions of your body. Bites on the torso, neck and head are much more damaging and difficult to treat than those on the limbs.
- Remember that rattlers do not always signal their presence by rattling.
- Do not attempt, **under any circumstances**, to capture snakes. If snake bite occurs take the patient to the nearest medical facility.

Symptoms

The first symptoms of poisonous snake bites are immediate pain, severe swelling and dark purple discoloration. The puncture made by the snake's fangs can usually be seen. As time progresses, there is great weakness, shortness of breath, rapid pulse, nausea, vomiting and dim vision. If the bite is made by a non-poisonous snake, none of the above symptoms appear. Only horseshoe shaped surface scratches made by the snake's teeth can be seen.

Immediate Treatment

- Your first effort should be to calm the victim. Try to get him or her to remain still . Exercise stimulates circulation which causes the venom to spread quickly.
- Remove rings, bracelets, watches and other constricting items.
- Locate fang marks.
- Cleanse the wound site with soap and water or an antiseptic if available.
- Apply a lightly constrictive band above and below fang marks if possible. In some cases you may only be able to apply a band above the wound site. The band should be 3/4 to 1-1/2 inches wide. The band should occlude only the superficial blood flow. After the band has been applied, the rescuer should be able to slip a finger beneath the band to determine that the band is not too tight.
- Immobilize the affected extremity with a splint of some kind.
- Conserve body heat and elevate victim's feet to delay the development of shock. **However, if bite is located on leg, do not elevate**.
- The affected body part of the snake bite should be elevated at the level of the heart or below.
- Contact a medical facility for advice.
- If directed by medical authority, apply an ice bag, if available, or a chemical cold pack, but do not pack the affected body part in ice.
- Opening the skin to remove venom is a surgical procedure that is only to be done in a hospital by trained persons. Placing a constricting band around the arm or leg above the bite is usually all that can be done.
- Transfer the victim to a medical facility as quickly as possible.
- If the snake can be killed without risk or delay, take it to the hospital for identification.

C. Hot Weather

There are three problems related to heat. All are dangerous and one is immediately life-threatening. Knowing the symptom and first aid is vital to your protection and that of your co-workers.

1. Heatstroke (Sunstroke)

Heatstroke is a life-threatening emergency. It is a breakdown of the body's ability to regulate its own temperature. Heatstroke is caused by

extremely high body temperature due to exposure to heat. The symptoms (any or all may be present) are:

- Body temperature extremely high (often 106 degrees or higher)
- Skin is hot and dry. The victim does not sweat.
- Rapid, strong pulse.
- Possible unconsciousness or confusion.

Immediate Treatment

- Cool the victim off any way possible. Spray the victim with water, sponge them down, apply ice packs or even submerge victim in a tub of cold (not iced) water.
- Continue treatment until the body temperature has lowered to 101 or 102 degrees.
- Do not over cool. Remember the body cannot control its own temperature and over cooling can be dangerous.
- Get medical attention **immediately**.

2. Heat Exhaustion

Heat exhaustion can occur after prolonged exposure to high temperatures and humidity. The symptoms are:

- Body temperature normal or slightly above normal
- Clammy and pale skin
- Heavy sweating
- Tiredness, weakness
- Dizziness
- Headache, nausea
- Possible muscle cramps
- Possible fainting or vomiting

Treatment

- Move victim into shade or a cooler area.
- Have victim lie down.
- Loosen clothing and raise feet 8-12 inches.
- If victim is not vomiting, give clear juice or sips of cold water. Some salt (up to 1 tsp. per glass) can be given. Give the victim half a glass of liquid every 15 minutes for one hour. Stop fluids if the victim vomits.
- Place cool wet cloths on the victim's forehead and body.
- If possible, use a fan or air conditioner to cool the victim.

- If symptoms are severe, last more than an hour, or become worse, seek prompt medical help.

3. Heat Cramps

Heat cramps are muscle pains and spasms caused by a loss of salt from the body due to heavy sweating. Strenuous activity in hot temperatures can lead to heat cramps. Usually the muscle of the stomach and legs are affected first. Heat cramps may also be a symptom of heat exhaustion. The symptoms (any or all may be present) are:

- Painful muscle cramping and spasms
- Heavy sweating
- Possible convulsions

Treatment

- Victim should sit quietly in a cool place.
- Apply firm hand pressure to affected area or gently massage victim's cramped muscles.
- If victim is not vomiting, give clear juice or sips of cool water. One teaspoon of salt should be added to each glass of water. Give the victim one-half glass of liquid every 15 minutes for one hour.

4. Skin Cancer

Skin covers our entire body. It is made up of the Epidermis Layer and the Dermis Layer. There are three type of cells which make up the outer epidermis layer:

- Squamous Cells – flat, scaly cells found on the outer layer of the skin.
- Basal Cells – rounder cells found at the base of the epidermis layer.
- Melanocytes – the cells which give out skin color, and cause a tan.

The Dermis Layer, below the epidermis, contains deeper structures like blood vessels, nerves and glands. There are three types of skin cancer which occur in each epidermal cell type. **Skin cancer is slow to develop and can take up to 20 years to be seen.** Squamous Cell Cancer and Basal Cancer are the most common and respond the best to treatment. The most serious form of cancer is Melanoma. Melanoma is on the rise in our population, increasing by four percent each year. An estimated 800,000 cases of skin cancer are being diagnosed each year. Many of these cancers will be in the form of the two most common skin cancers. However, Melanoma will affect about 80,000 people this year.

What causes skin cancer?

Sunlight, made up of ultraviolet radiation, causes direct damage to the cells of the epidermis. As the damage occurs, the cells can become cancerous and can become malignant or spread to areas away from the primary source. Sunlight is made of both UVA and UVB rays. Tanning is your skins reaction to UV light, however, it does not prevent skin cancer.

- **UVA: Aging Rays** – The UVA rays penetrate the skin deeply, all the way to the dermis and causes fine lines and wrinkles, or aging of the skin. The leathery appearance of the skin of "sun worshippers" is caused from the UVA rays of the sunlight.
- **UVB: Burning Rays** – UVB rays cause damage to the epidermal cells of the skin; the squamous cells, basal cells and melanocytes. UVB can cause these cells to become cancerous and potentially malignant leading to death.

The total amount of sun received over the years and the episodes of intense sun, including sunburn increases your risk of skin damage leading to skin cancer. It is estimated that people get 80% of their lifetime exposure to the sun by the age of 18. Heredity and the environment also is involved in the skin cancer equation. Fair skinned people have a higher risk as their natural protection is minimal. The ozone layer, which filters out UV radiation, is thinning allowing more UV radiation through to the earth. UV light is stronger as altitude increases due to less atmosphere protection. The closer to the equator you are the higher the risk for overexposure to UV light. Clouds afford some protection by blocking up to 50 percent of the rays from penetrating to the earth's surface.

What is SPF?

SPF stands for sun protection factor. This is the incremental time you can stay in the sun without burning. If you normally burn in ten minutes without protection, then an SPF 30 will provide you with 30 times or 300 minutes of protection without burning. A sunscreen should provide both UVA and UVB protection.

What are some safety tips for those who work in the sun?

- Use a sunscreen of **SPF 30 or higher**.
- Apply the sunscreen to all exposed area of the skin.
- Wear protective clothing, including a broad brimmed hat to shade the neck and ears.
- Wear UV-blocking eyewear or sunglasses to prevent damage to the retina.

- Practice self-skin examination. Look at your moles and the features of your skin. If you spot anything that causes concern, see your doctor immediately.
- Reapply sunscreen liberally, every two hours, especially after perspiring.

What are the signs of skin cancer?

Moles and pigmented lesions on the skin should be observed for several changes.

- A skin growth that increases in size, and appears translucent, tan, black, brown or multicolored.
- A mole that changes color or texture, becomes irregular in shape and gets larger.
- A spot or growth that continues to itch, hurt, crust, erode or bleed.
- An open sore that lasts for more than four weeks, or that heals and then reopens.

There are four warning signs when it comes to Melanoma, called the ABCD warning signs:

- A-Asymmetry – some part of the mole doesn't appear like the other part.
- B-Border – irregular, notched or jagged edges.
- C-Color – varied and multiple colors of the mole or lesion.
- D-Diameter – size which is larger than a pencil eraser.

Nonmelanoma skin cancer is the most common malignancy occurring in the Caucasian population of the United States. There are 18 times more nonmelanoma skin cancers than melanoma cancers. Estimates of up to 1.2 million cases of nonmelanoma skin cancers are diagnosed annually. **Approximately 2,100 deaths are caused by nonmelanoma skin cancers.**

D. Cold Weather

There are two cold weather related conditions which can cause death or severe injury if not attended to:

1. Hypothermia

Hypothermia is the severe chilling of the entire body and it is life-threatening. Hypothermia risks are much higher when cold and wet conditions exist. The first line of defense against hypothermia is to stay warm and dry. The symptoms (any or all may be present) are:

- Shivering (often uncontrollable)
- Numbness
- Drowsiness, sleepiness or mental confusion
- Muscle weakness or loss of coordination
- Low body temperature
- Loss of consciousness

Treatment

- Maintain an open airway and restore breathing.
- Bring the victim to a warm place immediately.
- Remove wet clothes and wrap the victim in warm blankets, towels, additional clothing, etc.
- Get medical assistance as soon as possible.
- If the victim is conscious, give him or her warm (not hot) drinks such as coffee, tea or soup. Do not give alcoholic beverages.

2. Frostbite

Frostbite is the freezing of parts of the body due to exposure to very low temperatures. Frostbite occurs when ice crystals form in the fluid in the cells of the skin and other body tissues. The toes, fingers, nose and ears are the most often affected Often the victim is not aware he or she has frostbite until someone else notices the symptoms. The symptoms (any or all may be present) are:

- Early Stages – Pain is often present and the skin appears red.
- Advanced – The skin becomes white or grayish yellow. It appears and feels waxy and firm. The skin feels very cold and numb and the pain disappears. Blisters may form.

Immediate Treatment

- Cover the frozen part with extra clothing or a warm cloth. If your hand or fingers are frostbitten, put hand under armpit next to body for additional warmth.
- Do not rub a frostbitten part with snow or anything else.
- Bring the victim out of the cold promptly.
- A frostbitten area should be re-warmed rapidly. Put the victim's frostbitten part in warm (not hot) water that is between 100 and 104 degrees. Test the water with a thermometer or by pouring water over the inside of the your arm.
- If warm water is unavailable, gently wrap the frostbitten part in blankets or other warm materials.
- Do not use heat, lamps, hot water bottles or heating pads.
- Do not allow the victim to place a frostbitten part near a hot stove or radiator. Frostbitten parts may become burned before feeling returns.
- Do not break blisters.
- Stop warming process when the skin becomes pink and/or feeling begins to come back.

Continued Care

- Give the victim warm drinks such as tea, coffee or soup.
- Have the victim exercise fingers and toes as soon as they are warmed.
- Do not allow a victim with frostbitten feet or toes to walk. This may cause further damage to frostbitten parts.
- Keep frostbitten parts elevated.
- Take extreme care that the frostbitten area is not re-frozen after it is thawed.
- Contact medical help as soon as possible.

E. Railroads

Under no circumstance is work to be performed on property of active railroads until permission has been obtained from appropriate railroad authorities. The railroads in Maryland that require right-of-entry agreements are:

- AMTRAK
- CSX
- Conrail
- Norfolk Southern
- Western Maryland Railroad

All employees working within the Right-of-Way of AMTRAK property must have attended the "Railroad Safety Orientation Class" and display proof of valid certification. Although the railroads will supply flagmen for their protection, personnel should take extreme caution working in the vicinity of tracks and overhead wires.

Observe the following guidelines when working within an operating railroad right-of-way:

- Always be alert around railroads. Railroad equipment may not be heard, especially on noisy work sites.
- Never crawl under stopped railroad cars or over couplings, and do not cross tracks between closely-spaced cars. They may be bumped at any time.
- Avoid any use of the color red. **Red means "immediate danger" and "STOP" to a train operator**. Surveyors must not wear red clothing or use red markers, flagging, or lights when working near rails.
- Do not leave protruding stakes or any holes within 15 feet of the centerline of the tracks.
- Do not park vehicles within 15 feet of the tracks.
- If it becomes necessary to tape across railroad tracks, support steel tapes above the rails at all times as contacting of both rails at once by a steel tape can activate signals.
- Do not leave instruments or other equipment unattended, on or near tracks.

F. Underground Utilities (Manholes)

Location and identification of sub-surface utilities requires certain safety precautions. Most manholes are in traffic areas and require at least one worker, as a flagger with the sole responsibility of protecting the person(s) attending the manhole.

Opening Manholes

1. Equipment

- Manhole hook – A J-shaped tool that hooks through the venthole on the manhole cover. It allows you to lift straight up using your legs.
- Pick – For sliding manhole covers off sideways.
- Crowbars – Only long crowbars that allow you to stand while sliding the manhole cover are acceptable.
- Wedge tools (shovels, crowbars, large screwdrivers) – These should **never be used alone** to move manhole covers, but only

for the initial unseating of the lid. Use another lifting device to move the lid aside.

2. Rules and Techniques

- Do not try to move a manhole cover with your hands, except as a last resort. If you must use your hands be extremely careful.
- Always wear steel-toed boots when moving a manhole cover.
- Stand facing the manhole, do not kneel, keep feet apart with knees bent. Keep your back straight but not necessarily vertical.
- Slide manhole covers off. Lift only to break them loose and to clear the rim.
- Lift with your legs, not your back. Keep your arms in close to your body and never try to move a manhole cover with just one arm.
- Know your limit and get help with heavy or large diameter cover.
- Never look away from a manhole cover being moved. Often they will slip, roll or wobble enough to injure a foot or hand.
- To close manholes, slide the cover back into place. Always test the cover by stepping on the sides of the cover when in place. If unstable, reopen it, clean debris from lip of rim, close and retest.

Entering Manholes

Whether the manhole is a storm drain or sanitary sewer, use extreme caution. Sanitary sewers should not be entered without first being tested for gases. Under no circumstance is a worker to enter a manhole without another worker(s) stationed at the entrance to render assistance in case of emergency.

The atmosphere in a manhole presents many dangers to workers:

1. Explosive (gas or vapors)

- Gasoline usually enters sewers from leaking gas station tanks. Gasoline is explosive and fatally toxic at high concentrations. Hydrocarbon fuel oils and kerosene also present similar dangers.
- Solvents usually enter the sewer system throughout industrial dumping. They are generally irritants in low concentration and can

cause headache, dizziness and nausea but may be fatal in high concentration. Some solvents are suspected cancer causing carcinogens. They are characterized by a strong aromatic odor.

- Methane is a colorless, odorless gas that is the product of the natural breakdown of sewage. Methane is usually found in the top of manholes. It can asphyxiate as well as explode.

2. Oxygen Deficient

A true oxygen deficiency is a decrease in the oxygen content of the atmosphere below the level that can sustain life. This deficiency can occur when aerobic breakdown of the sewage takes place, using up the oxygen available.

An oxygen deficiency is usually present in areas with little ventilation or air circulation and some sort of biological or chemical process occurring. An example is a confined space containing water or sewage that is closed for long periods of time, where extensive oxidation (rust) occurs.

3. Toxic

Gases produced by the natural processes in the sewage or from certain chemicals dumped or leaked into the sewer can be fatal. Some gases, while not fatal, can cause mild to severe injury by irritating eyes, respiratory tract or skin.

- Hydrogen Sulfide is the most likely to be encountered in a manhole. It is a colorless, heavier-than-air gas that is the by product of the sewage and decaying organic material. It is a heavy gas that usually is found in the lower parts of a manhole. The gas **kills** by paralyzing the respiratory center of the brain. It has a sulfur, "rotten egg" smell at first. **Beware – do not trust sense of smell to detect it**.
- Carbon Monoxide is a chemical asphyxiant that can be **fatal within minutes** with exposure to high concentrations. It is colorless, odorless, and lighter than air. Carbon Monoxide is the

product of almost any kind of combustion or hydrocarbon oxidation.

- Chlorine is **fatal at low concentrations**. It is yellow-green in color and detectable by its choking odor and irritant qualities. Chlorine is usually introduced industrially or in treatment process.

Atmospheric Testing

Before any crew member enters a sewer manhole, the air should be tested for the presence of gases. Gas detection instruments are available, such as the "GasTechtor 3220 HS" or equivalent, which is the primary gas detection instrument for use in the U.S. This gas meter simultaneously tests for explosive gas and oxygen level conditions. The meter is calibrated to set off an alarm at levels that are below those recognized as immediately dangerous.

There are cartridge type respirators that can be worn by workers, however, they are not intended to detect gases. Respirators are recommended by National Institute Occupational Safety and Health for use in filtering out the types of dusts and particles frequently found in a manhole.

G. First Aid

All survey vehicles should be equipped with stocked first aid kits.

Although some form of first aid should be administered immediately, in the case of injury other than minor wounds, cuts, sprains or abrasions, etc., emergency medical services (911) should be obtained.

All survey personnel receive CPR and First Aid training and recertification at regular intervals.

Other than basic treatment, procedures such as CPR should only be administered by someone who has received training.

Some injuries that should receive immediate attention by crew members are:

1. **Bleeding** – Usually, applying direct pressure to the wound will control bleeding long enough to get additional medical attention if necessary.

- Place sterile dressing or cleanest cloth available on wound. If possible, use latex gloves, extra dressings or plastic wrap.
- Do not remove first dressing if blood-soaked; add additional dressings over it.
- If bleeding continues, elevate part above victim's heart and continue pressing on wound.
- If bleeding continues, seek medical attention immediately.

2. Choking (conscious victim) – using the Heimlick maneuver

- Stand behind the victim.
- Wrap your arms around victim's waist. (Do not allow your forearms to touch the ribs).
- Make a fist with one hand and place the thumb side just above victim's naval and well below the tip of the sternum.
- Grasp fist with your other hand.
- Press fist into victim's abdomen with five quick upward thrust.
- Each thrust should be a separate and distinct effort to dislodge the object.

After every five abdominal thrusts, check the victim and your technique.

Repeat cycles of up to five abdominal thrusts until:

- Victim coughs up object.
- Victim starts to breathe forcefully.
- Victim becomes unconscious.

Unconscious victim – Heimlick maneuver

- Straddle victim's thighs.
- Put heel of one hand against middle of victim's abdomen slightly above navel and well below sternum's notch fingers of hand point toward victim's head).
- Put other hand directly on top of first hand.
- Press inward and upward using both hands with up to five quick abdominal thrusts.
- Each thrust should be distinct and a real attempt made to relieve the airway obstruction. Keep heel of hand in contact with abdomen between abdominal thrust.

Perform finger sweep

- **Use only on unconscious victim**. On a conscious victim, it may cause gagging or vomiting.
- Use your thumb and fingers to grasp victim's jaw and tongue and lift upward to pull tongue away from back of throat and away from foreign object.
- If unable to open mouth to perform the tongue-jaw lift, use the crossed-finger method by crossing the index finger and thumb and pushing the teeth apart.
- With index finger of your other hand, slide finger down along the inside of one cheek deeply into mouth and use a hooking action across to the other cheek to dislodge foreign object.
- If foreign object comes within reach, grab and remove it. Do not force object deeper.

If the above steps are unsuccessful, cycle through the following steps in rapid sequence until the object is expelled, or Emergency Service arrives.

- Give two rescue breaths. If unsuccessful, re-tilt head and try two more.
- Do up to five abdominal thrust.
- Do a finger sweep.

3. Sprains, Strains, Contusions, Dislocations

Unless a dislocation shows the appearance of deformity, these type of injuries receive the same basic immediate treatment:

- Apply cold by either crushed ice wrapped in towel or plastic bag, cold packs, chemical "snap packs", or cold water immersion.
- Compression of the affected area by elastic bandage is recommended, but not too tight.
- Elevation of part above the level of heart.
- Do not apply heat until 48 hours after injury.
- If recuperation seems long, consult a physician.

H. Accidents and Injuries

There are responsibilities for both the injured employee and the immediate supervisor in the event of a work related accident or injury. The procedures for "First Report of Injury" must be followed including notifying the Assistant Division Chief and/or Division Chief.

1. Injured Worker Responsibilities

- Give prompt notice to Party Chief or Team Leader of any injury or incident.
- Complete a first report of injury form, when necessary.
- Provide accurate and complete information on the circumstances and nature of your injury.
- Cooperate in medical evaluations scheduled by SHA and/or the insurance company.
- Provide complete medical documentation as required.
- Accept any temporary modified assignment that may be provided to meet temporary medical restrictions.

2. Party Chief or Team Leader

- Provide access to medical care.
- Notify the Assistant Division Chief and/or the Division Chief as soon as possible and not later than the end of the work day.
- Review and/or complete First Report of Injury Form and submit to the Assistant Division Chief.
- Compile accurate and detailed information to complete reports.
- Ensure that reports are completed promptly and submitted. If necessary, an incomplete First Report of Injury Form maybe submitted until a revised form can be submitted.
- Investigate and obtain witness statements as necessary.
- Assist employee with questions or problems.
- Contact Injured Worker's Insurance Fund (IWIF) and the Assistant Division Chief within 24 hours of the incident.

IV. COMMON HEALTH RISKS

A. Lyme Disease

What is it?

Lyme Disease (LD) is an infection caused by **Borelia burgdorferi**, a type of bacterium call a **spirochete** (pronounced spy-ro-keet) that is carried by deer ticks. An infected tick can transmit the spirochete to the humans and animals it bites. Untreated, the bacterium travels through the bloodstream, establishes itself in various body tissues, and can cause a number of symptoms, some of which are severe.

LD manifests itself as multisystem inflammatory disease that affects the skin in its early, localized stage, and spreads to the joints, nervous system, and to a lesser extent, other organ systems in its later, disseminated stages. If diagnosed and treated early with antibiotics, LD is almost always readily cured. Generally, LD in its later stages can also be treated effectively, but because the rate of disease progression and individual response to treatment varies from one patient to the next, some patients may have symptoms that linger for months or even years following treatment. In rare instances, LD causes permanent damage.

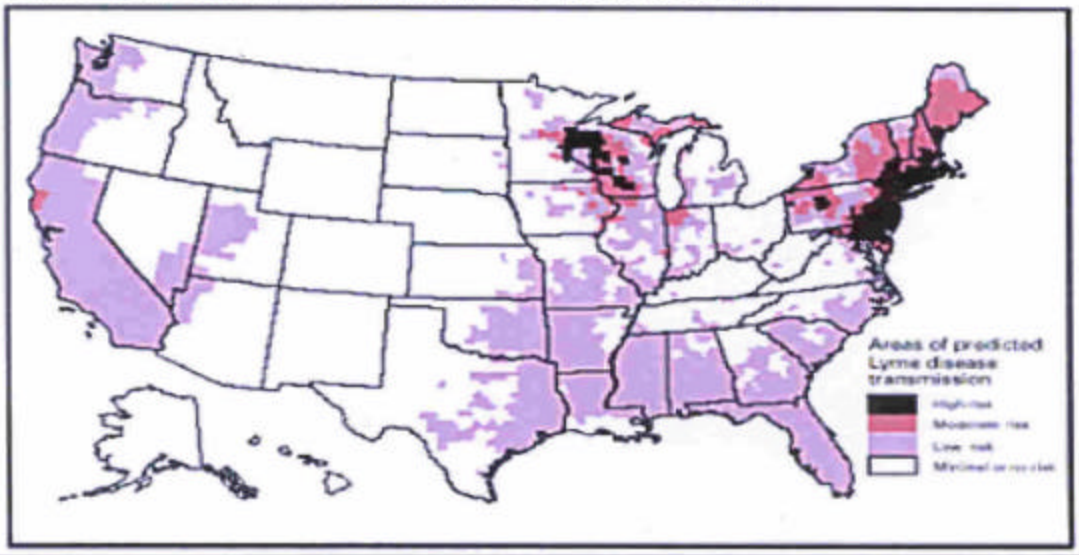
Where is Lyme Disease Prevelent?

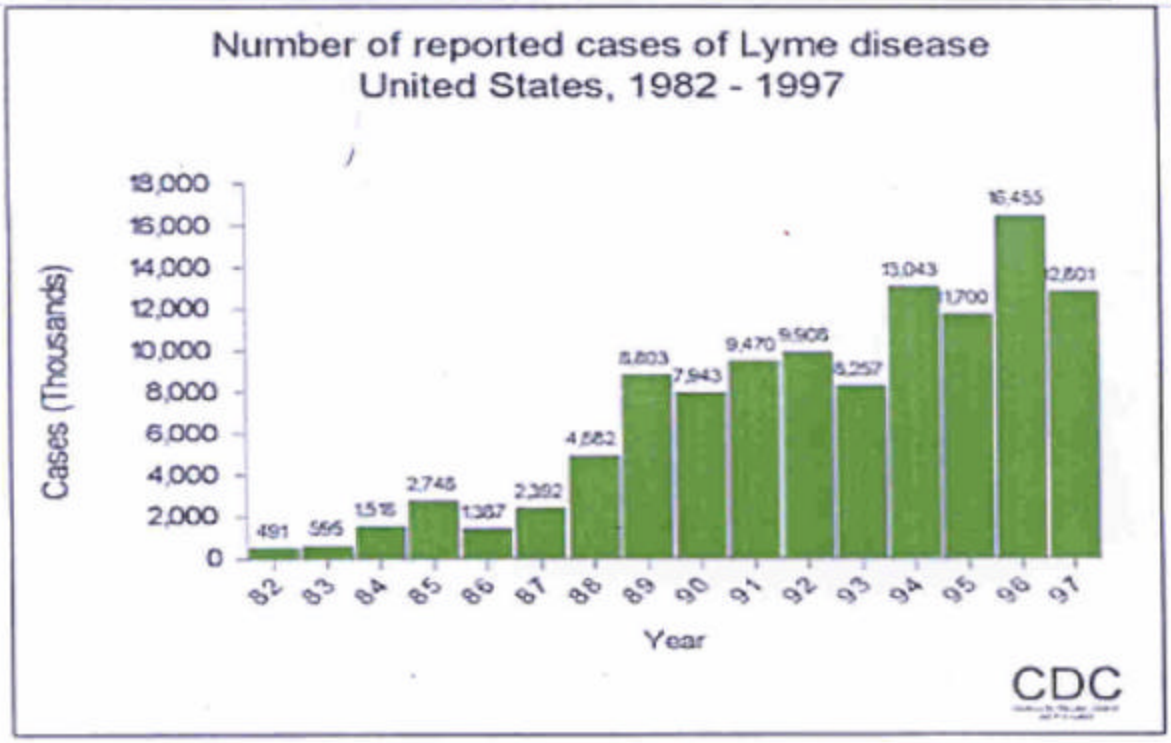
LD is spreading slowly along and inland from the upper east coast, as well as in the upper midwest and the northern California and Oregon coast. The mode of spread is not entirely clear and is probably due to a number of factors such as bird migration mobility of deer and other large mammals, and infected ticks dropping off of pets as people travel around the country.

The prevalence of LD in the northeast is due to the presence of large numbers of the deer tick's preferred hosts – white- footed mice and deer and their proximity to humans. White-footed mice serve as the principal "reservoirs of infection" on which many nymphal (juvenile) ticks feed and become infected with the LD spirochete. An infected tick can then transmit its spirochete to its next host. (e.g., an unsuspecting human).

The LD spirochete infects other species of ticks but is known to be transmitted to humans and other animals only by the deer tick. Studies have shown that an infected tick normally cannot begin transmitting the spirochete until it has been attached to its host about 36-48 hours.

National Lyme disease risk map with four categories of risk





What are the symptoms?

The early symptoms of LD can be mild and easily overlooked. People who are aware of the risk of LD in their communities and who don't ignore the sometime subtle early symptoms are most likely to seek medical attention and treatment early enough to be assured of a full recovery.

The first symptom is usually an expanding rash (called erythema migrans, or EM, in medical terms), which is though to occur in 80 percent to 90 percent of all LD cases. An EM rash generally has the following characteristics:

- Usually (but not always) radiates from the site of the tick bite.
- Appears either as a solid red expanding rash or blotch, or a central spot surrounded by clear skin that is in turn ringed by an expanding red rash (looks like a bull's eye).
- Appears an average of one to two weeks (range=3 to 30 days) after transmission.
- Has an average diameter of five to six inches (range=2 inches to 2 feet).
- Persists for about three to five weeks.
- May or may not be warm to the touch.
- Is usually not painful or itchy.

Erythema Migrans rashes appearing on brown-skinned or sun-tanned patients may be more difficult to identify because of decreased contrast between normal skin tones and the red rash. A dark bruise-like appearance is more common on dark-skinned patients.

Ticks will attach anywhere on the body, but prefer body creases such as the armpit, groin, back of the knee, and nape of the neck; rashes will therefore often appear in, but not restricted to, these areas. Please note that multiple rashes may, in some cases, appear elsewhere on the body some time after the initial rash, or, in a few cases, in the absence of an initial rash.

Around the time the rash appears, other symptoms such as joint pain, chills, fever and fatigue are common. However, they may not seem serious enough to require medical attention. These symptoms may be brief, only to recur as a broader spectrum of symptoms as the disease progresses.

As the LD spirochete continues disseminating through the body, a number of other symptoms including severe fatigue, a stiff, aching neck, and peripheral nervous system (PNS) involvement such as tingling or numbness in the extremities or facial palsy (paralysis) can occur.

The more severe, potentially debilitating symptoms of later-stage LD may occur weeks, months, or, in a few cases years after a tick bite. These can include severe headaches, painful arthritis and swelling of joints, cardiac abnormalities, and central nervous system (CNS) involvement leading to cognitive (mental) disorders.

The following is a check list of common symptoms seen in various stages of LD:

Localized Early (Acute) Stage:

- Solid red or bull's eye, usually at the site of the bite
- Swelling of lymph glands near tick bite
- Generalized achiness
- Headache

Early Disseminated Stage:

- Two or more rashes not at the site of the bite
- Migrating pains in joints and/or tendons
- Headache
- Stiff, aching neck
- Facial palsy (facial paralysis similar to Bell's palsy)
- Tingling or numbness in extremities
- Multiple enlarged lymph glands
- Abnormal pulse
- Sore throat
- Changes in vision
- Fever of 100 to 102 F
- Severe fatigue

Late Stage:

- Arthritis (pain and/or swelling)
- Disabling neurological disorders (disorientation, confusion, dizziness, short term memory loss, inability to concentrate, finish sentences or follow conversations; mental "fog")
- Numbness in arms, hands, legs and/or feet

Is diagnosis accurate?

If you think you have symptoms of LD you should see your physician immediately. The EM rash, which may occur in up to 90 percent of the reported cases, is a specific feature of LD, and treatment should begin immediately.

Even in the absence of an EM rash, diagnosis of early LD should be made solely on the basis of symptoms and evidence of a tick bite, not blood test, which can often give false results if performed in the first month after initial infection (later on, the tests are considered more reliable). If you live or work in a endemic area, have symptoms consistent with early LD and suspect recent exposure to a tick, present your suspicion to your doctor so that he or she may make a more informed diagnosis.

If early symptoms are undetected or ignored, you may develop more severe symptoms weeks, months or perhaps years after you were infected. In this case, the Center for Disease Control recommends using a two step procedure known as ELISA and Western blot but even these test do not always indicate current infection. A positive result can support, but not establish a clinical diagnosis of LD.

Can Lyme Disease be treated?

Doxycycline, amoxicillin and ceftin are the three oral antibiotics most highly recommended for treatment of all but a few symptoms of LD. Treatment of late-Lyme patients is, unfortunately, an inexact science. Treatment approaches for patients with late-stage LD have become a matter of considerable debate.

Can Lyme Disease be prevented or controlled?

Deer ticks prefer to hide in shady, moist ground litter, but can be found above the ground clinging to tall grass, brush, shrubs and low tree branches. The also inhabit lawns and gardens, especially at the edges of woodlands and around old stone walls where deer and white-footed mice, the ticks preferred hosts, thrive. No natural, vegetated area can be considered completely free of infected ticks.

Deer ticks cannot jump or fly, and do not drop above onto a passing animal. Potential hosts acquire ticks only by direct contact with them. Once a tick latches onto human skin it generally climbs upward until it reaches a protected or creased area, often the back of the knee, groin, navel, armpit, ears, or nape of the neck. It then begins the process of inserting its mouthparts into the skin until it reaches the blood supply. In tick infested areas, the best precaution against LD is to avoid contact with soil, leaf litter and vegetation as much as possible. However, if you need to work or spend time in these areas you should use a combination of precautions to dramatically reduce your chances of getting LD:

- Wear enclosed shoes and light-colored clothing
- Scan clothes and any exposed skin frequently
- Use insect repellent containing DEET (Diethyl-meta-toluamide) on skin or clothes.
- Avoid sitting on the ground or on stone walls

- Do a final, full-body tick-check at the end of the day

Anyone aged 15 to 70 who is at high risk for LD should consider receiving the LD vaccine series as an adjunct to the precautions listed above. After three shots given over a year, the vaccine can reduce your risk of contacting LD by 80 percent, and maybe covered by your insurance policy.

What do I do if I find a tick?

Do not panic. Not all ticks are infected, and studies of infected deer ticks have shown that they begin transmitting LD an average of 36 to 48 hours after attachment. Therefore, your chances of contacting LD are greatly reduced if your remove a tick within the first 24 hours. Remember, too, that the majority of early LD cases are easily treated and cured.

To remove the tick:

- Using a pair of precision tweezers, grasp the tick by the head or mouth parts right where they enter the skin. **DO NOT** grasp the tick by the body.
- Without jerking, pull firmly and steadily directly outward. **DO NOT** twist the tick out or apply petroleum jelly, a hot match, alcohol or any other irritant to the tick in an attempt to get it back out. These methods can backfire and even increase the chances of the tick transmitting the disease.
- Place the tick in a vial or jar of alcohol to kill it.
- Clean the wound with disinfectant.

Then monitor the site of the bite for the appearance of a rash beginning 3 to 30 days after the bite. At the same time learn about the other early symptoms of LD and watch to see if they appear in about the same time frame. If a rash or other early symptoms develop, see a physician immediately.


5mm

B. PFIESTERIA

What is it?

Discovered in 1988, Pfiesteria is a one-celled microbe that can become poisonous. More specifically, it is a dinoflagellant – a microorganism that propels itself in water with two tails, called flagella.

There are about 1,200 dinoflagellates. The large majority aren't toxic. Most dinoflagellantes are plants called phytoplankton or algae. They gain energy from photosynthesis. But some, including Pfiesteria, behave more like animals. They consume plankton and other organic matter.

What is Pfiesteria's life cycle?

A lot about Pfiesteria is unknown. The microbe may go through about 24 stages during its life. It exists in three main forms; the swimming creature propelled by the tails, an amoeba-like form and a cyst-like form.

Pfiesteria spends much of its life lying dormant, in cyst form, in muddy river bottoms. Responding to some signal-excretions from fish, perhaps-the cell transforms into its toxic form and attacks.

How does Pfiesteria attach fish?

Pfiesteria's toxin, or poison, causes fish flesh to melt away. Scientists say the microbes swarm the fish and eat bits of flesh as they fall off.

The Pfiesteria also can attach to the fish using a tongue-like extension called a peduncle. The microbe then sucks blood and bodily fuilds from its prey. Pfiesteria's poison leaves sores, called lesions, on the fish.

For reason not fully understood, Pfiesteria most often attacks menhaden, an oily, rarely eaten fish used in pet foods.

Where have fish been killed?

Pfiesteria is believed to have killed millions, perhaps up to a billion fish in North Carolina between 1990 and 1997. In 1997 it was blamed for killing tens of thousands of fish in Maryland and perhaps 2,000 in Virginia.

Is it unusual for fish to get sores?

No. Sores are typically caused by bacteria or fungi. They can also be caused by injuries-say, from nets. Sores from Pfiesteria, however, are distinctive in appearance and location.

Does Pfiesteria hurt humans?

Apparently, but only under certain conditions. Laboratory researchers in North Carolina reported being sickened after they were exposed to high doses of the toxin in water or air. Symptoms included memory loss, severe headaches, blurred vision and disorientation. The effects of Pfiesteria in the wild are much less clear. A state-appointed team of doctors in Maryland examined about two dozen people complaining of Pfiesteria-related sickness. The Maryland doctors said they found 11 people who suffered from memory lapses and confusion attributable to Pfiesteria.

No one has died of Pfiesteria.

Where is Pfiesteria found and how long has it been there?

The microbe apparently lives in slightly salty waters from the Gulf of Mexico to the Delaware Bay. It has probably existed for thousands, if not millions, of years.

Where has Pfiesteria been found in its toxic form?

This is a tricky question. Researchers say toxic Pfiesteria has been in North Carolina and in the Maryland portion of the Pocomoke River.

Are fish from the Chesapeake Bay and its tributaries safe to eat?

The Health Department says yes. There are no reports of anyone getting a Pfiesteria-related sickness from seafood. But health officials advised the public to use common sense, and not to eat fish with sores.

Can people swim and work in rivers and the Chesapeake Bay?

As much as ever. Just don't go where you see dead fish. Caution should always be taken as there are contaminants other than Pfiesteria.

C. WEST NILE VIRUS

What is it?

West Nile Virus is a mosquito-born virus that can cause encephalitis (inflammation of the brain) or meningitis (inflammation of the brain and spinal cord).

How is it spread?

West Nile Virus is spread to humans by the bite of an infected mosquito. A mosquito becomes infected by biting a bird that carries the virus. You can not get West Nile Virus from a person who has the disease. West Nile Virus is not spread by person-to-person contact such as touching, kissing, or caring for someone who is infected.

Can you get West Nile Virus directly from birds?

There is currently no evidence that West Nile Virus can be spread directly from birds to people. However, dead birds can carry a variety of disease and, therefore, should never be handled with bare hands. Use gloves to carefully place dead birds in double-plastic bags and then place in the outdoor trash.

What do I do if I find a dead bird?

The public can help state officials monitor for the virus by reporting all dead birds to the local Health Department at 1-866-866-2769. The state will compile data on the number of dead birds reported. Selected crows, blue jays and raptors (i.e. hawks, falcons or owls) will be tested within 24 hours of death before they become too decomposed. Sunken eyes and the presence of fly larvae (maggots) are good indicators that the bird has been dead too long for effective testing.

Besides mosquitoes, can you get West Nile Virus directly from other insects or ticks?

Infected mosquitoes are the primary source of West Nile Virus. There is no evidence to suggest that ticks or other insects transmit West Nile Virus.

What are the symptoms of West Nile Virus infection?

Most people who are infected with West Nile Virus either have no symptoms or experience mild illness such as a fever, headache and body aches before fully recovering. Some persons also develop a mild rash or swollen lymph glands. In some individuals, particularly the elderly, West Nile Virus can cause serious disease that affects the brain tissue. At its most serious, it can cause permanent

neurological damage and can be fatal. Symptoms of encephalitis (inflammation of the brain) include the rapid onset of severe headache, high fever, stiff neck, confusion, loss of consciousness (coma), or muscle weakness, and may be fatal.

How is West Nile encyphalitis treated?

There is no specific therapy. In more severe cases, intensive supportive therapy is indicated, i.e., hospitalization, intravenous fluids, and nutrition, airway management, ventilatory support (ventilator) if needed, prevention of secondary infections (pneumnia, urinary tract, etc.), and good nursing care.

Is there a vaccine for West Nile Virus?

No. A vaccine for West Nile Virus does not exist.

What do I do if I think I have West Nile Virus?

If you are bitten by a mosquito, you don't need to see a doctor. Most people who suffer a mild illness due to West Nile Virus, recover and no treatment is necessary. Testing for West Nile Virus in people involves a blood or spinal fluid test that can take several weeks to confirm.

How can I prevent getting West Nile Virus?

Wear long, loose and light colored clothing. Use insect repellent products with no more than 20-30 percent DEET. Spray repellent on your hands and they apply to your face. Only apply repellent to exposed skin and clothing. Do not use repellent under clothing. Do not apply repellent over cuts, wounds, sunburn or irritated skin. Wash off repellent daily and reapply as needed.

D. Animal Bites (Rabies)

What is Rabies?

Rabies is a disease caused by a virus found in the saliva of infected animals and is transmitted to pets and humans by bites or possibly by contamination of an open cut. Treatment of an infected person is critical. Untreated, rabies causes a painful death.

What do I do if I am bitten?

If bitten by a wild animal, an animal officer should sacrifice the animal. All biting wild animals should be tested for rabies as soon as possible.

If bitten by a cat or dog, obtain information about the pet animal. Include a description of the animal and licensing number or identification, owner's name, address and telephone number and the rabies vaccination status whenever available.

Immediately cleanse the wound thoroughly with soapy water.

Get medical attention. Go to the nearest emergency room.

Do not delay, you may need treatment.

Report all bites to your local health department or animal control agency.

What are the symptoms of rabies?

The first symptoms of rabies may be nonspecific flu-like signs; malaise, fever or headache, which may last for days. There may be discomfort or paresthesia at the site of exposure (bite), progressing within days to symptoms of cerebral dysfunction, anxiety, confusion, agitation, progressing to delirium, abnormal behavior, hallucinations and insomnia. The acute period of disease typically ends after two to ten days. Once clinical signs of rabies appear, the disease is nearly always fatal and treatment is typically supportive.

V. MEDICAL CARE SITES

MARYLAND LOCATIONS

CONCENTRA
MEDICAL CENTERS

THE OCCUPATIONAL HEALTHCARE SOLUTION

The following Medical Center site information is provided and are subject to changes, deletions and/or additions at any time. Users are asked to provide feedback to Plats and Surveys Division if they encounter incorrect information

ARBUTUS
AFTER HOURS FACILITY
1419 Knecht Avenue
Baltimore, MD 21227
410-247-9595
Fax: 410-247-7553
Hours: 7am Monday
12 noon Saturday
(24 Hours)

BWI
890 Airport Park Road
Suite 100
Glen Burnie, MD 21061
410-553-0110
Fax: 410-553-0197
Hours: 7:30am – 5pm
Monday – Friday

CAMBRIDGE
Shoreworks
Occupational Health
2 Aurora Street
Cambridge, MD 21613
410-338-5511
Fax: 410-228-5585
Hours: 8am – 4:30pm
Monday - Friday

COLUMBIA
6656 Dobbin Road
Columbia, MD 21045
410-381-1330
Fax: 410-381-5585
Hours: 7:30am-6pm
Monday – Friday

DELAWARE
4100 Stanton-Ogletown Road
Harmony Plaza
Newark, DE 19713
302-738-0103
Fax: 302-738-6612
Hours: 8am-5pm
Monday – Friday

DUNDALK
Holabird Industrial Park
1833 Portal Street
Baltimore, MD 21224
410-633-3600
Fax: 410-633-3604
Hours: 7:30am-5pm
Monday – Friday

FROSTBURG
Frostburg Medical Center
10701 New Georgias Creek Road
Frostburg, MD 21532
301-689-3229
Fax: 301-689-1129
Hours: 8am-8pm
Monday – Friday
8am-6pm
Saturday – Sunday

HAGERSTOWN
Antietam Occ Health
11110 Medial Campus Road
Suite 107
Hagerstown, MD 21742
301-714-4420
Fax: 301-714-4415
Hours: 7am-5:30pm
Monday – Friday

INNER HARBOR
110 St. Paul Street, Suite 100
Baltimore, MD 21202
410-752-3010
Fax: 410-539-7023
Hours: 3am-6pm
Monday – Friday
7am-1pm
Saturday

JESSUP
7377 Washington Blvd
Suite 101-102
Elkridge, MD 21075
410-379-3051
Fax: 410-379-3074
Hours: 7:30am-5pm
Monday – Friday

LANHAM
4451 G Parliament Place
Lanham, MD 20706
301-459-9113
Fax: 301-459-1214
Hours: 7am-12midnight
Monday – Friday
7am-12noon
Saturday

ROSEDALE
8101 Pulaski Highway
Suite H, I, J
Baltimore, MD 21237
410-687-6462
Fax: 410-687-2261
Hours: 7am-12midnight
Monday – Friday
7am-12noon
Saturday

SALISBURY
Occupational Health
166 Tilgham Road
Salisbury, MD 21804
410-543-7188
Fax: 410-543-7505
Hours: 8am-6pm
Moday – Friday

TIMONIUM
1840 York Road, Suite E
Timonium, MD 21093
410-252-4015
Fax: 410-252-7410
Hours: 8am-5pm
Monday – Friday

WALDORF
Convenient Health Care
12090 Old Line Center
Waldorf, MD 20602
301-843-4800
Fax: 301-870-6838
Hours: 9am-8pm
Monday – Thursday
9am-5pm
UDS/PHYS
Friday – Sunday
9am-5pm
Mon/Tues/Thurs
9am-2pm
Wed/Fri/Sat/Sun

YORK
716 Loucks Road
York, PA 17404
717-846-9462
Fax: 717-846-9467
Hours: 7am-8pm
Monday – Friday
7am-2pm
Saturday

CENTER INFORMATION

- All patients are seen on a walk-in basis. Work-related injuries receive immediate triage assessment.
- Pre-placement exams and DOT physicals are seen on a walk-in basis. Exam forms are provided or may use your company's specific forms.
- Working with CMC requires no contract. Our fees are competitive and adhere to the applicable state workers' compensation fee guidelines.

AFTER HOURS EMERGENCY NETWORK PROVIDER
Report To:
MERCY HOSPITAL EMERGENCY DEPARTMENT
301 Saint Paul Pl.
Baltimore, MD 21202
410-332-9477

VI. SHA MAINTENANCE FACILITIES

Allegany County (District #6)
LaVale Shop
1221 West Braddock Road
LaVale, MD 21504-3347
Phone: 301-729-8436
1-800-760-7138
Fax: 301-777-5822

Anne Arundel County (District #5)
Annapolis Shop
138 Defense Highway
Annapolis, MD 21401
Phone: 410-841-1009
1-800-331-5603
Fax: 410-841-2459

Glen Burnie Shop
Stewart Avenue
Glen Burnie, MD 21061
Phone: 410-766-3770
Fax: 410-766-1430

Baltimore County (District #4)
Hereford Shop
306 Mount Carmel Road
MD 137 & I-83
Parkton, MD 21120
Phone: 410-329-6756
Fax: 410-329-6784

Golden Ring Shop
8375 Pulaski Highway
Rosedale, MD 21237
Phone: 410-574-4511
Fax: 410-574-0183

Golden Ring Shop
8375 Pulaski Highway
Rosedale, MD 21237
Phone: 410-574-4511
Fax: 410-574-0183

Calvert County (District #5)
Prince Frederick Shop
MD 231 @ MD 2/4
Prince Frederick, MD 20678
Phone: 410-535-1748
Fax: 410-535-1564

Caroline County (District #2)
Denton Shop
508 Caroline Street
Denton, MD 21629
Phone: 410-479-0770
Fax: 410-479-1438

Carroll County (District #7)
Westminster Shop
150 Wyndtryst Drive
Westminster, MD 21157
Phone: 410-848-6565
1-800-807-8449
Fax: 410-876-8509

Charles County (District #5)
LaPlata Shop
Washington Avenue
LaPlata, MD 20646
Phone: 301-934-8031
Fax: 301-934-5318

Cecil County (District #2)
Elkton Shop
2024 E. Old Phila. Road
P.O. Box 486
Elkton, MD 21921
Phone: 410-398-1565
Fax: 410-398-0527

Dorchester County (District #1)
Cambridge Shop
750 Handley Road
Cambridge, MD 21613
Phone: 410-543-6923
Fax: 410-228-5804

Frederick County (District #7)
Frederick Shop
5111 Buckeysville Pike
Frederick, MD 21701-8305
Phone: 301-624-8251
1-800-635-5119
Fax: 301-624-8280

Thurmont Shop
Moser Road
Thurmont, MD 21788
Phone: 301-271-7787

Garrett County (District #6)
Keyser's Ridge Shop
3876 National Pike
Accident, MD 21520
Phone: 301-895-3234
Fax: 301-746-8677

Oakland Shop
95 SHA Drive
Oakland, MD 21550
Phone: 301-334-2133
Fax: 301-334-8557

Harford County (District #4)
Churchville Shop
3050 Churchville Road
Churchville, MD 21028
Phone: 410-838-7788
Fax: 410-734-4597

Howard County District #7)
Dayton Shop
Maryland Route 32
Dayton, MD 21036
Phone: 410-531-5533
Fax: 410-531-3114

Kent County (District #2)
Chestertown Shop
615 Morgnec Road, P.O. Box 299
Chestertown, MD 21620-0299
Phone: 410-778-0818
1-800-637-9740
Fax: 410-778-2014

Montgomery County (District #3)
Fairland Shop
12020 Plum Orchard Road
Silver Spring, MD 20904
Phone: 301-572-5166
1-888-252-9580
Fax: 301-572-5212

Gaithersburg Shop
502 Quince Orchard Road
Gaithersburg, MD 20706
Phone: 301-948-2477
1-888-795-0013
Fax: 301-948-8714

Prince George's County (District #3)
Laurel Shop
Talbot Ave. & Second Ave.
Laurel, MD 20810
Phone: 301-776-7619
1-800-785-2602
Fax: 301-317-5625

Marlboro Shop
6500 S.E. Crain Highway
Upper Marlboro, MD 20870
Phone: 301-952-0555
1-888-795-0012
Fax: 301-952-1657

Queen Anne's County (District #2)
Centreville Shop
111 Safety Drive
Centreville, MD 21617
Phone: 410-758-0700
Fax: 410-758-3014

Stevensville Shop
334 State Street
Stevensville, MD 21666
Phone: 410-643-5631

St. Mary's County (District #5)
Leonardtown Shop
26720 Point Lookout Road
Leonardtown, MD 20650
Phone: 301-475-8035
Fax: 301-475-3815

Washington County (District #6)
Hagerstown Shop
I-70 & MD 65
18320 Col. Henry Douglas Dr.
Hagerstown, MD 21740
Phone: 301-432-5394
Fax: 301-791-4694

Somerset County (District #1)
Princess Anne Shop
10980 Market Lane
Princess Anne, MD 21853
Phone: 410-651-1333
Fax: 410651-1574

Wicomico County (District #1)
Salisbury Shop
660 West Road
P. O. Box 2679
Salisbury, MD 21802-2679
Phone: 410-677-4050
1-800-825-4742
Fax: 410-543-6724

Talbot County (District #2)
Easton Shop
8265 Ocean Gateway, P.O. Box 745
Easton, MD 21601
Phone: 410-822-3525
Fax: 410-398-0527

Worcester County (District #1)
Snow Hill Shop
P. O. Box 268
Snow Hill, MD 21863
Phone: 410-632-0511

Statewide Operations Center (SOC)
410-582-5650
410-582-5651
1-888-963-307

Hanover Shop
7491 Connelley Drive
Hanover, MD 21076
Phone: 410-582-5593

College Park Traffic Operations Center (TOC 3) MSP
410-345-7130

Golden Ring Traffic Operations Center (TOC 4) MSP
410-780-2640

VII. SOURCES & GOVERNING MATERIAL

A. *"A Guide to Temporary Traffic Control in Work Zones"*
"*Quality Standards For Work Zone Traffic Control Devices*"

America Traffic Safety Services Association
Fredericksburg Virginia

B. *"Manual on Uniform Traffic Control Devices"* (MUTCD)
"Work Zone Traffic Control Manual" (WZTC)

Office of Traffic and Safety (OOTS)
Hanover, Maryland

C. *"Poison Ivy, Sumac & Oak"*
American Academy of Dermatology
Schumburg, Illinois

D. *"First Aid and CPR"*
National Safety Council
SOS Technologies
Livonia, Michigan

E. *Survey Safety Handbook"*
Florida DOT

F. *"Caltrans Survey Safety Manual"*
California DOT

G. Other Sources

- Center for Disease Control and Prevention
- Association Directors of State and Territorial Public Health Laboratory
- American Society for Microbiology
- National Center for Infectious Diseases
- ADS Environmental Services Inc.
- New York City Department of Health